

## CLAIMS

1. A power supply apparatus for a vehicle, comprising:
    - an electronic controller for outputting information for controlling
    - 5 braking of the vehicle to a brake based on at least one of information from a
    - brake pedal and information in response to a moving state of the vehicle;
    - a battery for supplying electric power to the brake via the electronic
    - controller;
    - an auxiliary power supply including a capacitor unit formed of a
    - 10 plurality of capacitors and a detection unit for detecting an abnormality in the
    - capacitor unit, the auxiliary power supply supplying electric power to the brake
    - via the electronic controller when the battery is in an abnormal state;
    - wherein, in charging or discharging the capacitor unit, the detection
    - unit measures an internal resistance value of the capacitor unit, measures an
    - 15 internal capacitance value of the capacitor unit from a rate of change of voltage
    - per unit time of the capacitor unit, and detects an abnormality in the capacitor
    - unit based on the measured internal resistance value and internal capacitance
    - value.
  - 20 2 The power supply apparatus for a vehicle according to claim 1, wherein,
  - in charging the capacitor unit, the detection unit measures an internal
  - resistance value of the capacitor unit from a voltage obtained when charging is
  - started or a voltage obtained when the charging is interrupted, and measures
  - an internal capacitance value of the capacitor unit from a rate of the change of
  - 25 voltage per unit time of the capacitor unit in charging.
3. The power supply apparatus for a vehicle according to claim 1, wherein,

in discharging the capacitor unit, the detection unit measures an internal resistance value of the capacitor unit from a voltage obtained when discharging is started or a voltage obtained when the discharging is interrupted, and measures an internal capacitance value of the capacitor unit from a rate of  
5 change of voltage per unit time of the capacitor unit in discharging.

4. The power supply apparatus for a vehicle according to claim 2,  
wherein the detection unit measures temperature of the capacitor unit  
in the charging,  
10 corrects the internal capacitance value and the internal resistance value  
at each temperature based on differences between each of the measured  
internal capacitance value and the measured internal resistance value and each  
of a standard internal capacitance value and a standard internal resistance  
value of the capacitor unit which are initialized in advance at the temperature  
15 measured in the charging, and  
judges whether or not the capacitor unit is in a normal state by  
comparing the corrected internal resistance value with a limit internal  
resistance value with respect to the corrected internal capacitance value at the  
each temperature.

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5. The power supply apparatus for a vehicle according to claim 3,  
wherein the detection unit measures temperature of the capacitor unit  
in the discharging,  
corrects the internal capacitance value and the internal resistance value  
25 at each temperature based on differences between each of the measured  
internal capacitance value and the measured internal resistance value and each  
of a standard internal capacitance value and a standard internal resistance

value of the capacitor unit which are initialized in advance at the temperature measured in the discharging, and

judges whether or not the capacitor unit is in a normal state by comparing the corrected internal resistance value with a limit internal  
5 resistance value with respect to the corrected internal capacitance value at the each temperature.

6. The power supply apparatus for a vehicle according to any of claims 1 to  
5, wherein the rate of change of voltage is measured multiple times every  
10 predetermined time.